Fifth Annual Conference on Carbon Capture & Sequestration

Steps Toward Deployment

Geologic Storage - Coal Seams

Using Discrete Fracture Network Models to Assess Risks Associated with Carbon Sequestration in Coal of the Black Warrior Basin

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SECARB Coal Group

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ACKNOWLEDGMENTS

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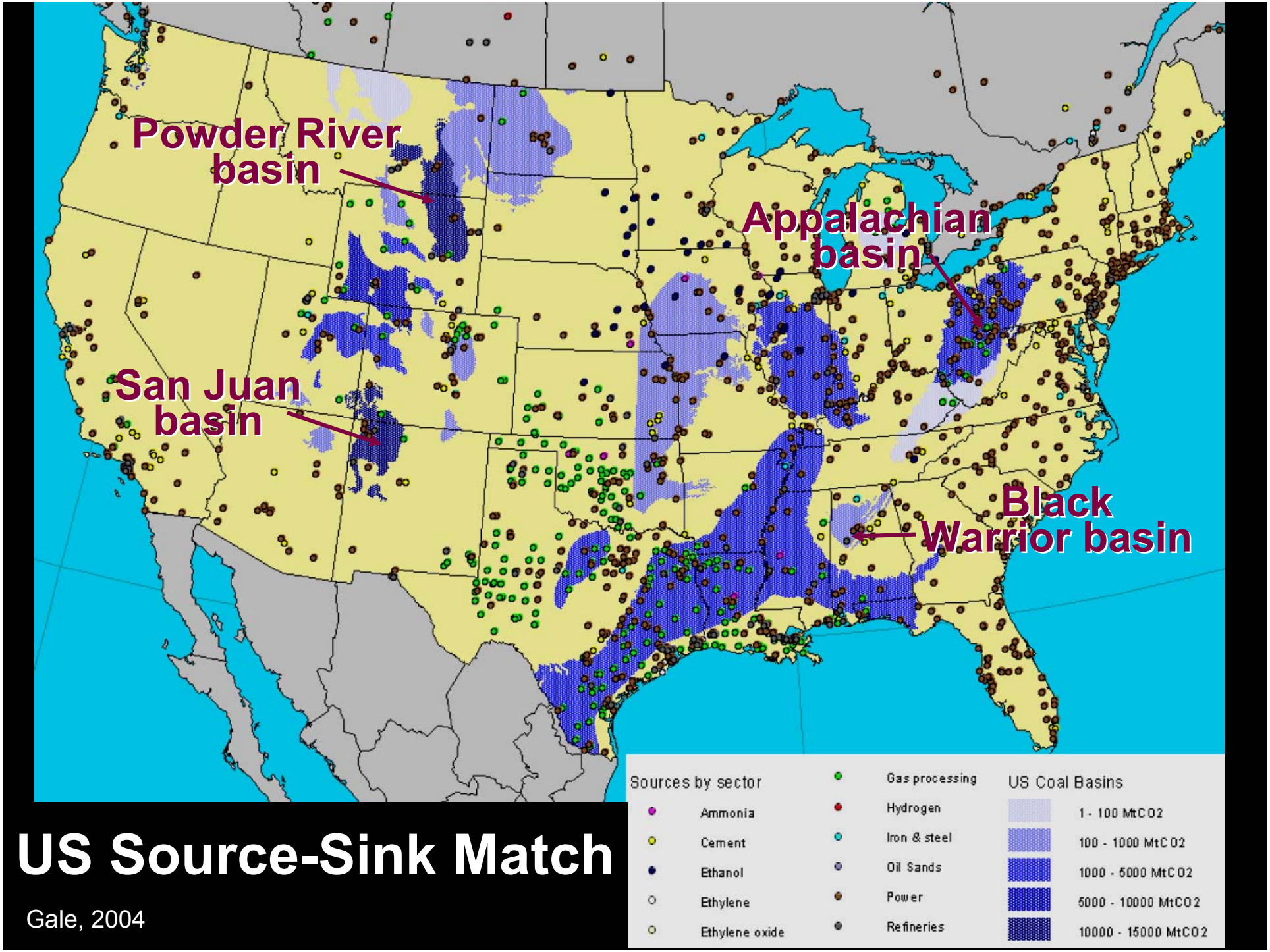
National Energy Technology Laboratory

Jim Walter Resources
SECARB
EPA Region 4

APPROACH

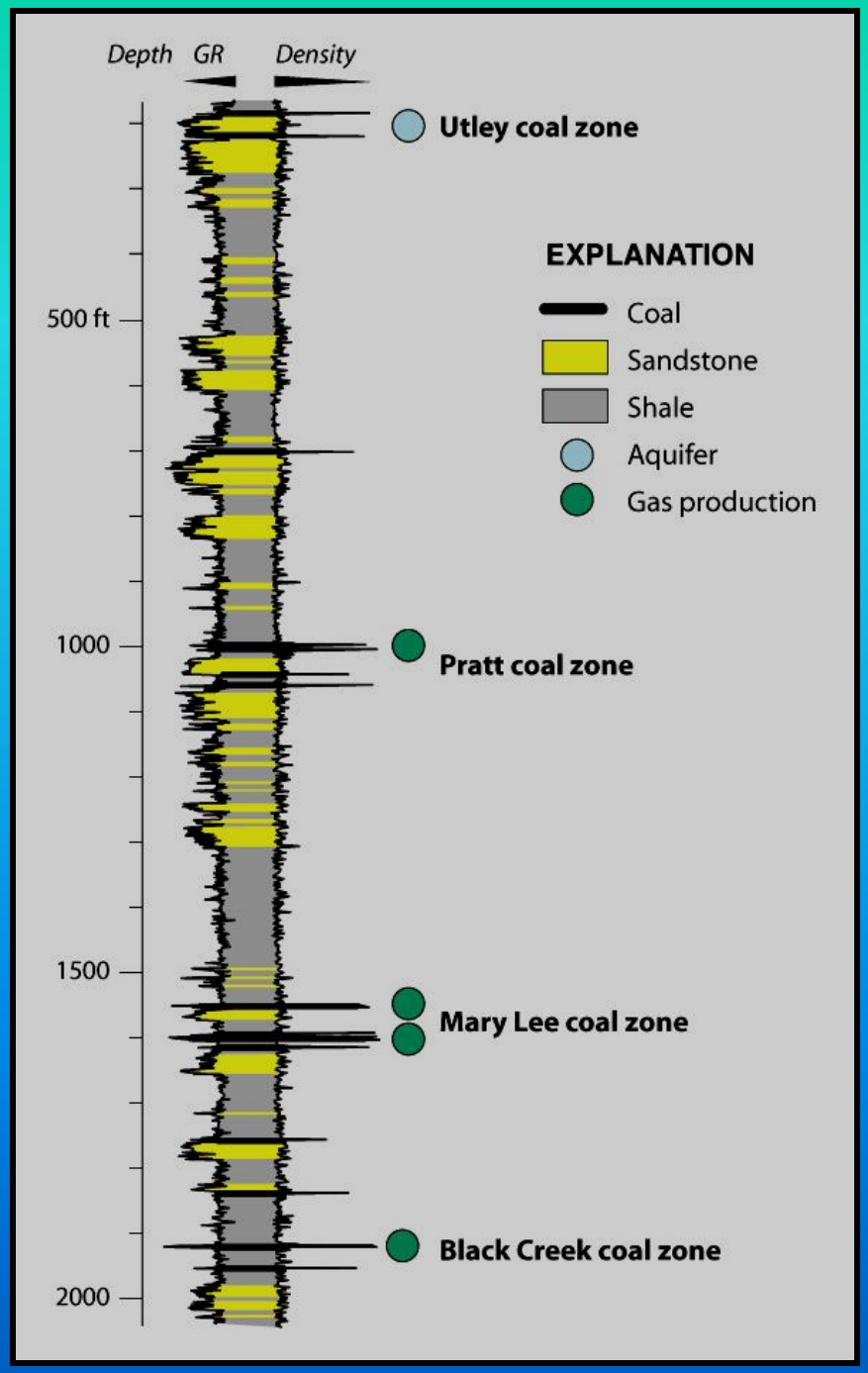
Well, Core, Outcrop Data

DFNModeler (structure)
TOUGH2 (flow)



US Source-Sink Match

Gale, 2004

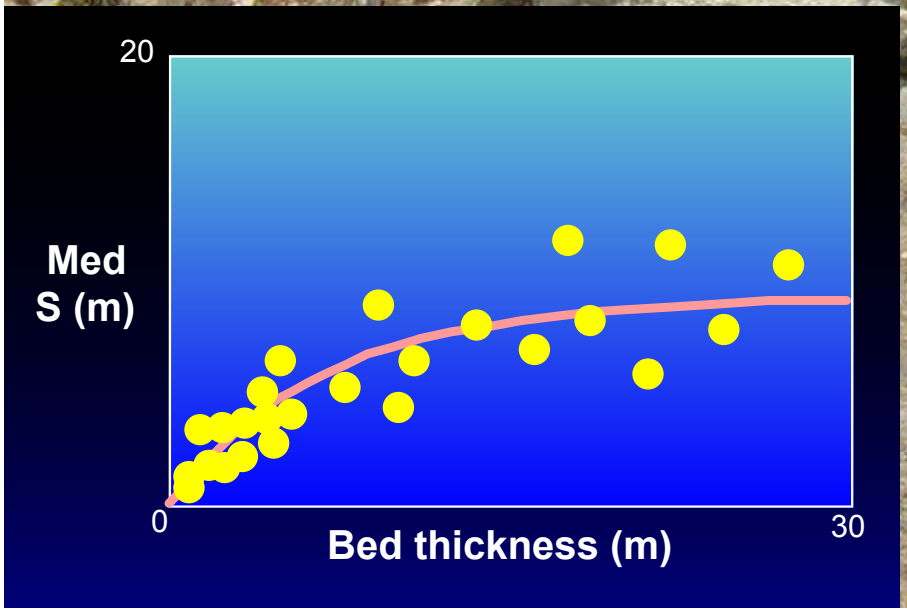


POTTSVILLE FORMATION

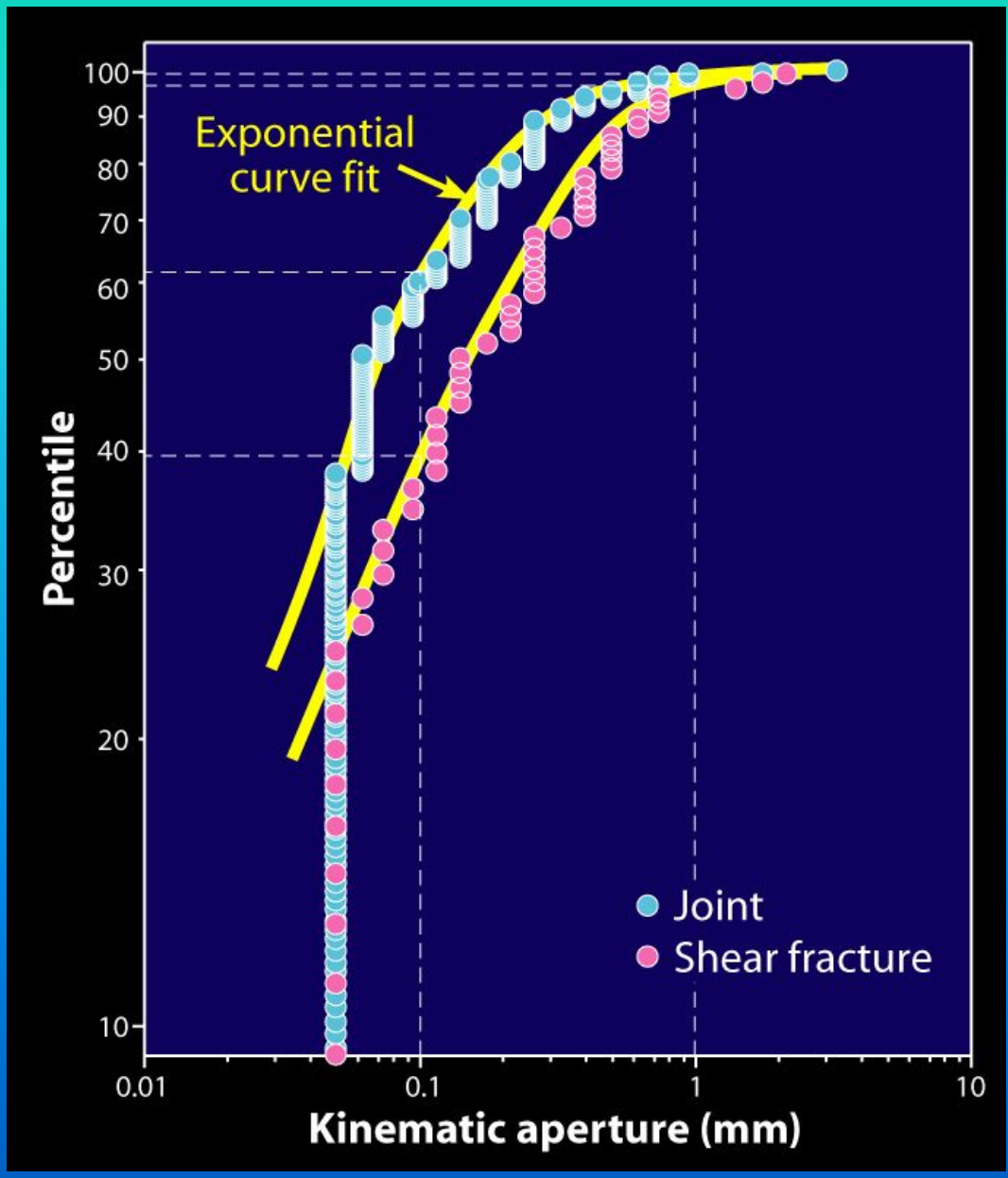
Cassidy 30-2-119
Blue Creek Field
Tuscaloosa Co., AL

FAULTING AND FRACTURING

STRATA-BOUND FRACTURES

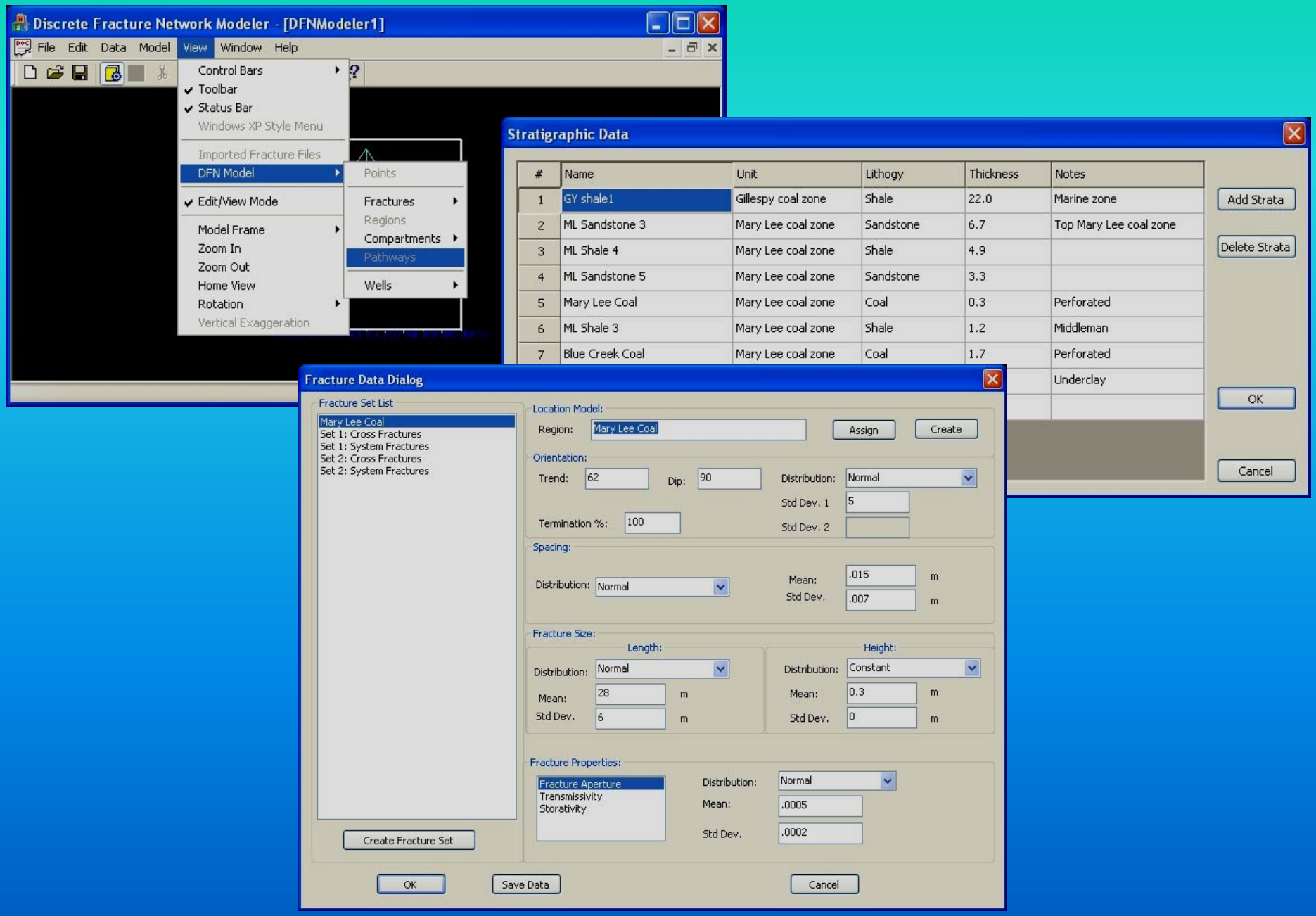


KINEMATIC APERTURE

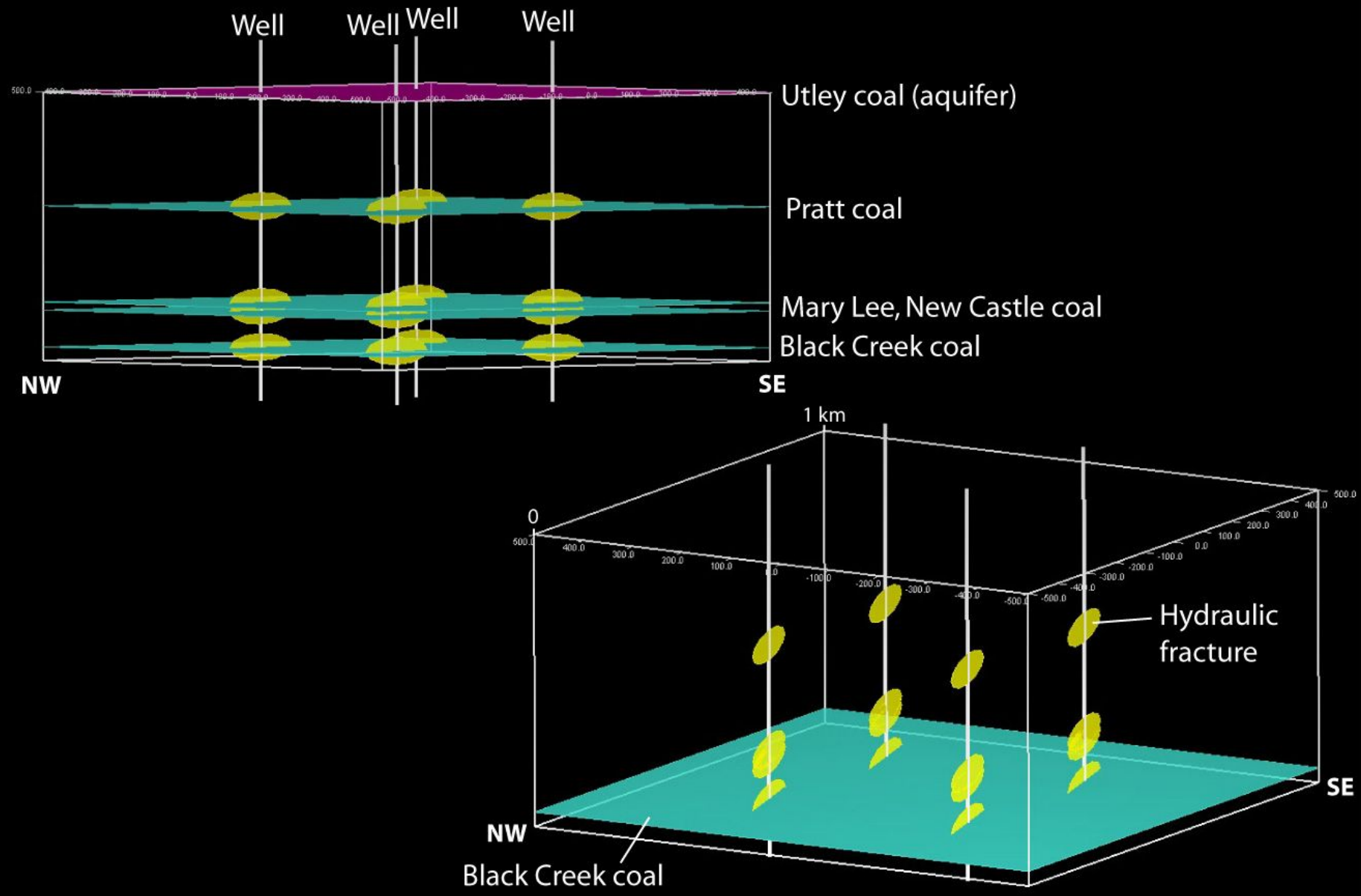


PRIMARY CLEAT

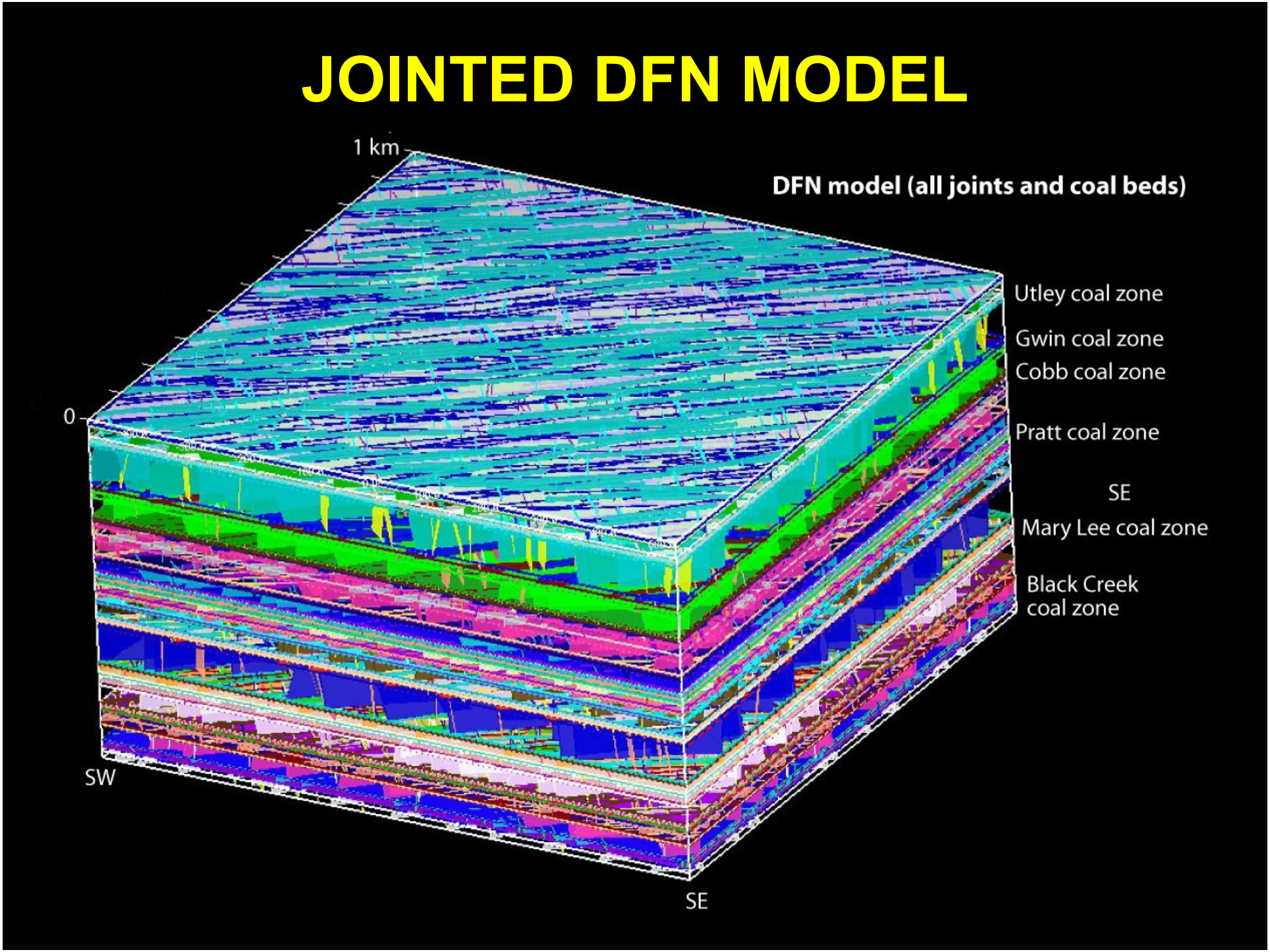
DFNModeler INTERFACE ELEMENTS



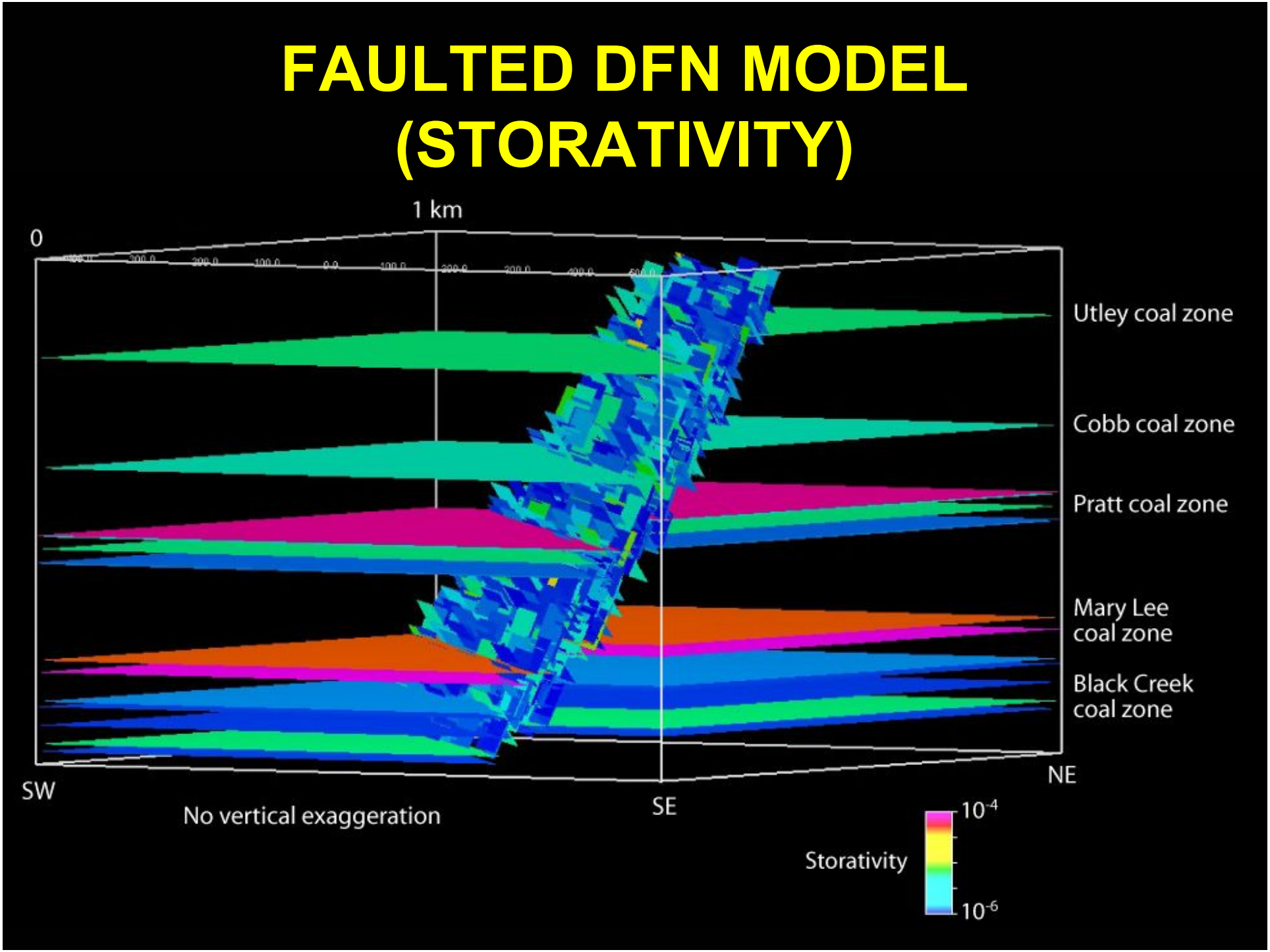
HYDRAULIC FRACTURES AND COAL



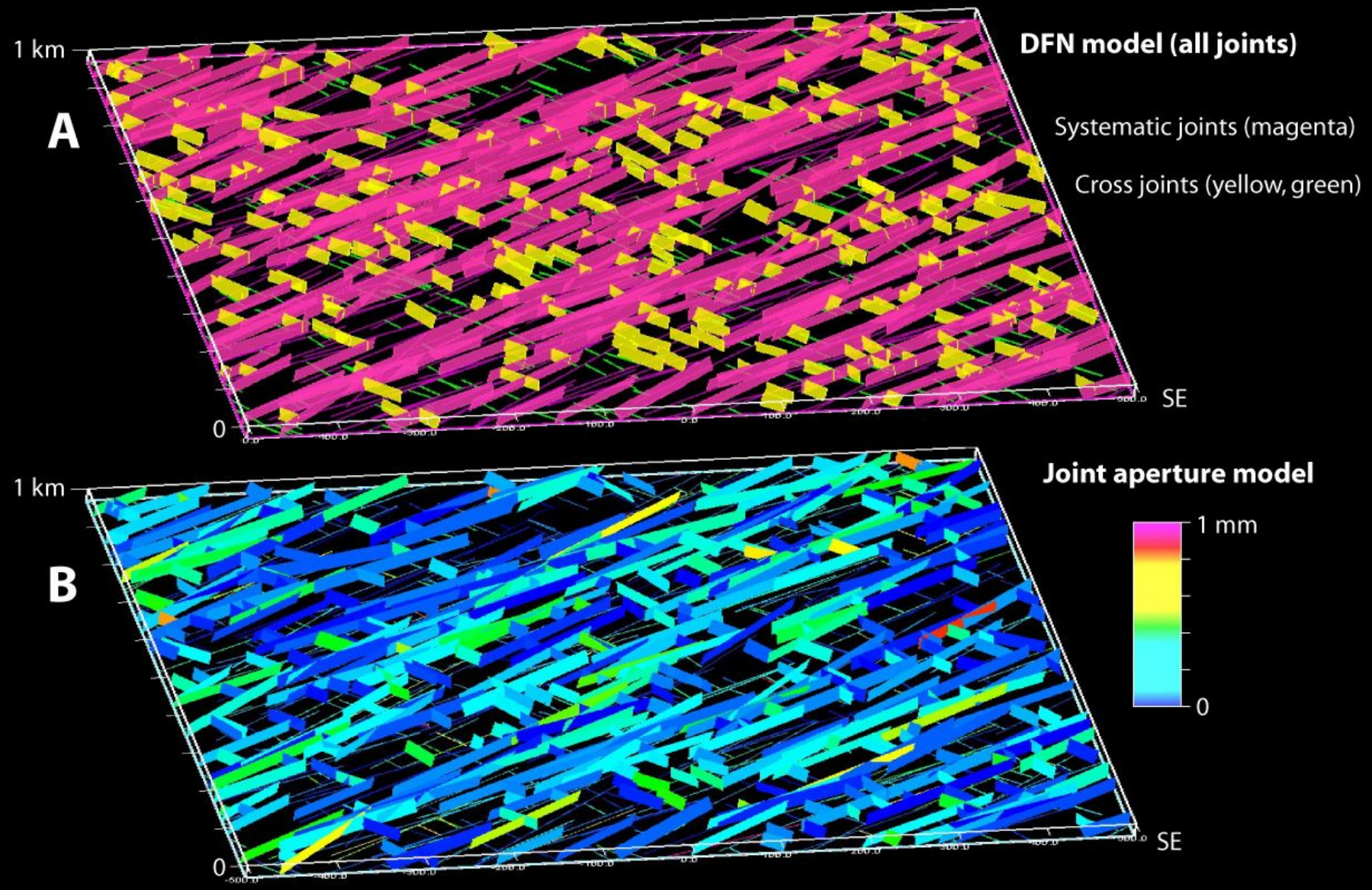
JOINTED DFN MODEL



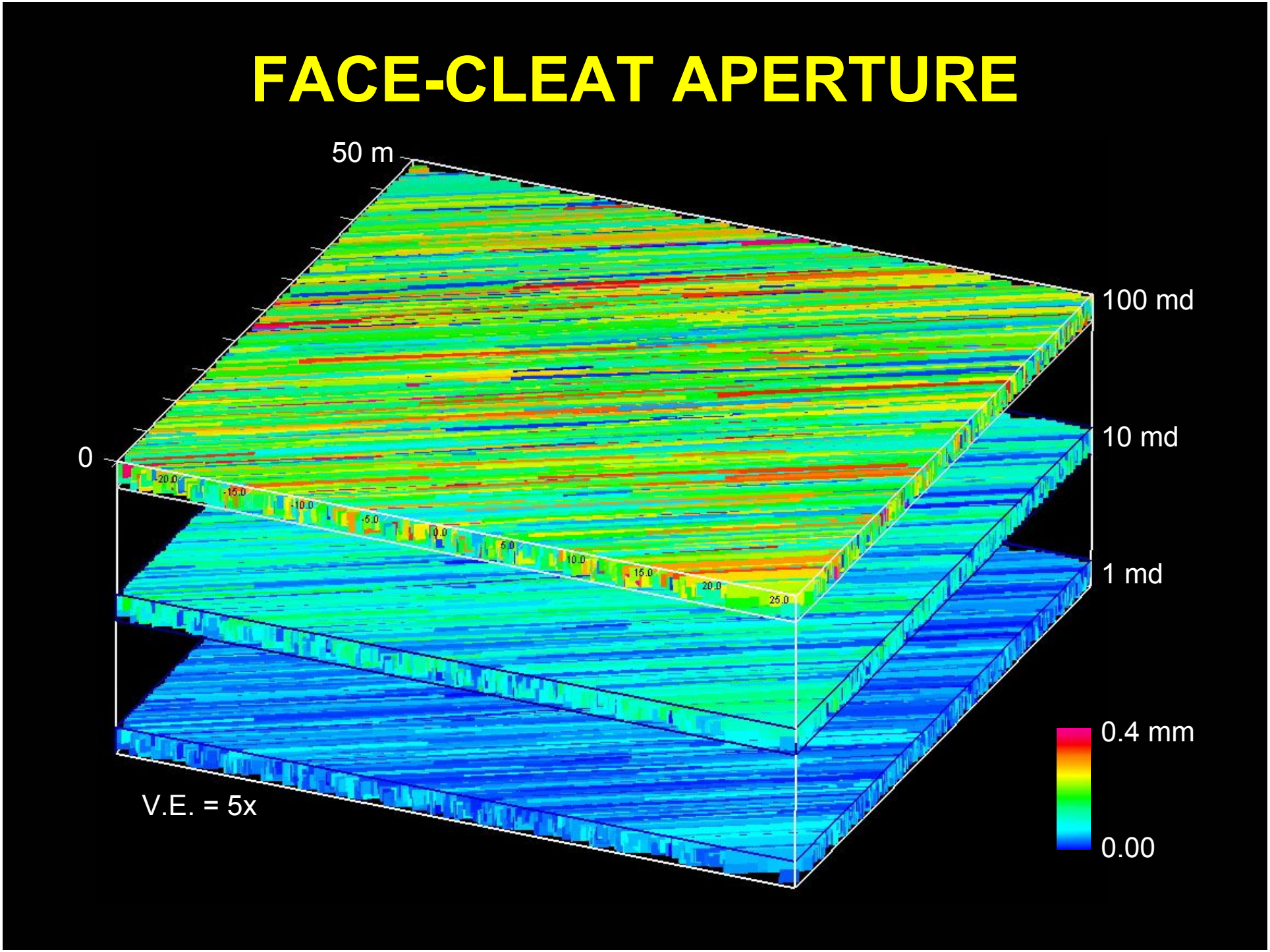
FAULTED DFN MODEL (STORATIVITY)



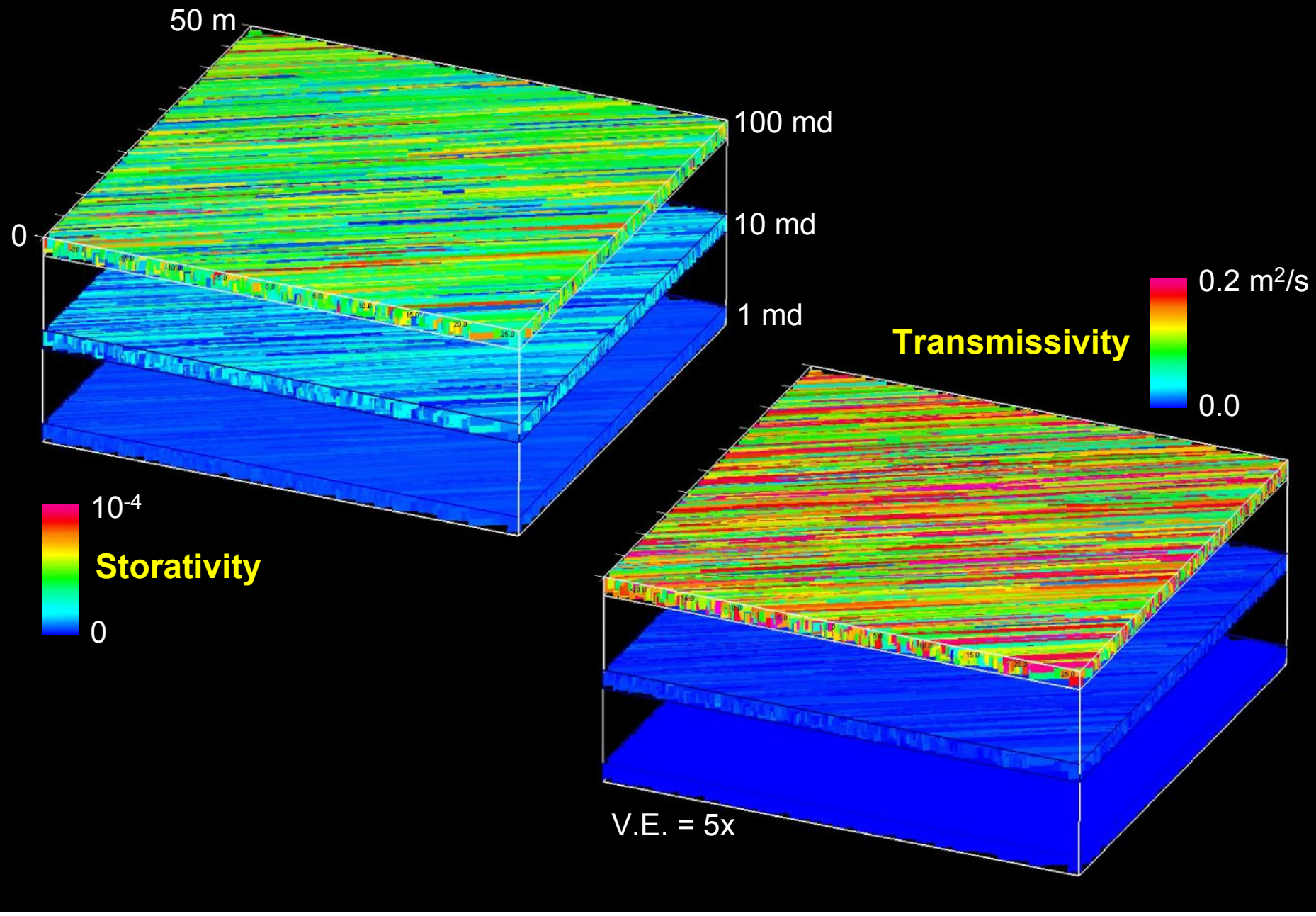
JOINT MODELS



FACE-CLEAT APERTURE

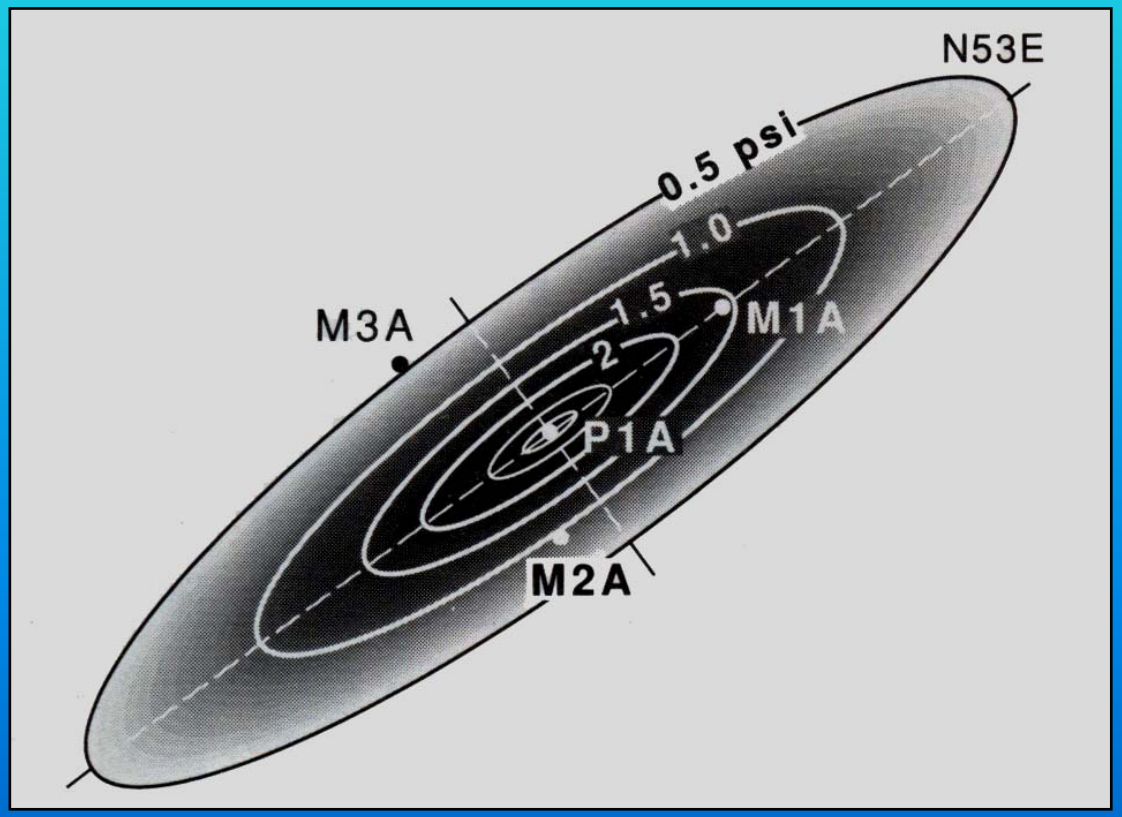


STORAGE AND TRANSMISSIVITY

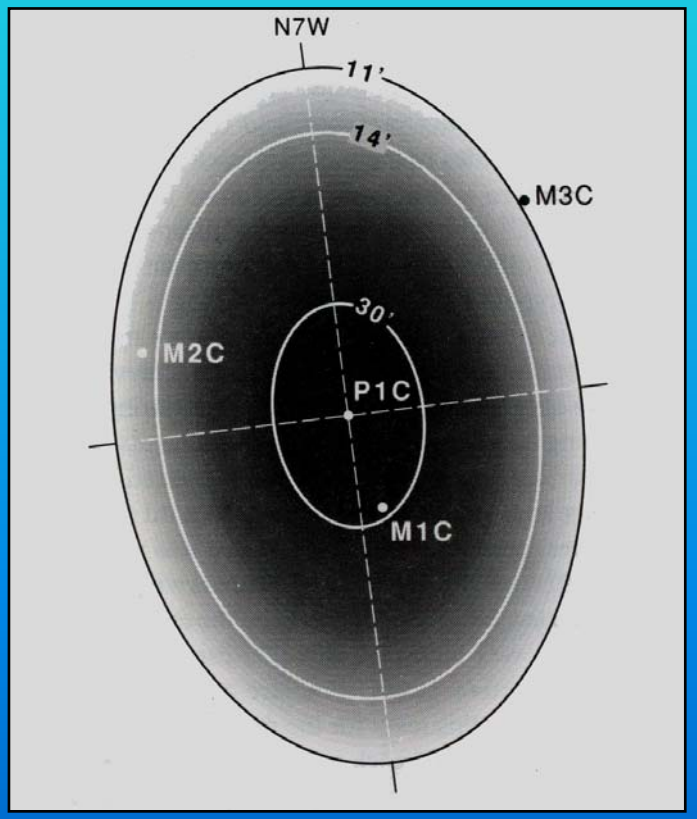


ROCK CREEK PRESSURE BUILDUP TEST RESULTS

PRATT COAL

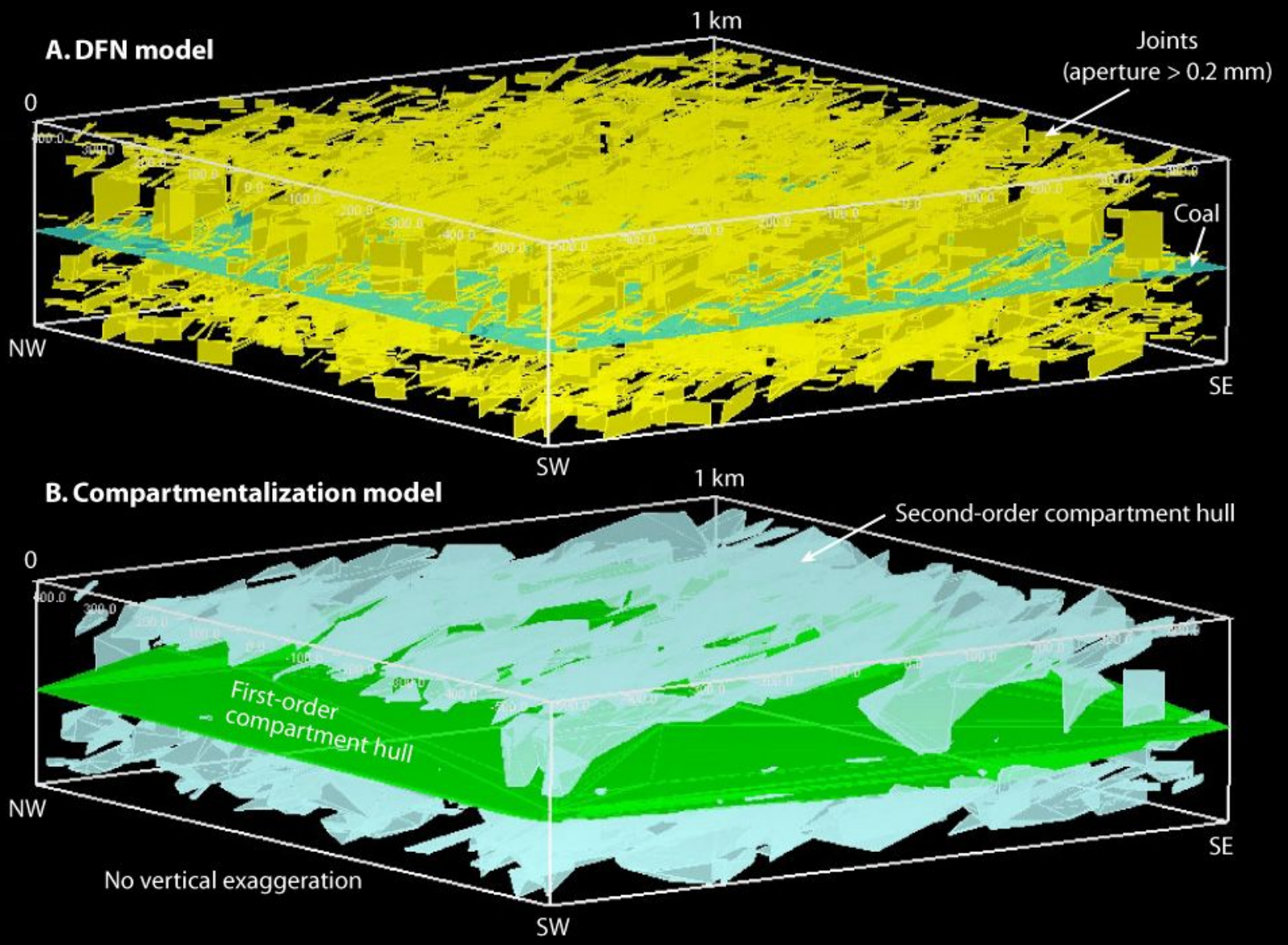


BLACK CREEK COAL



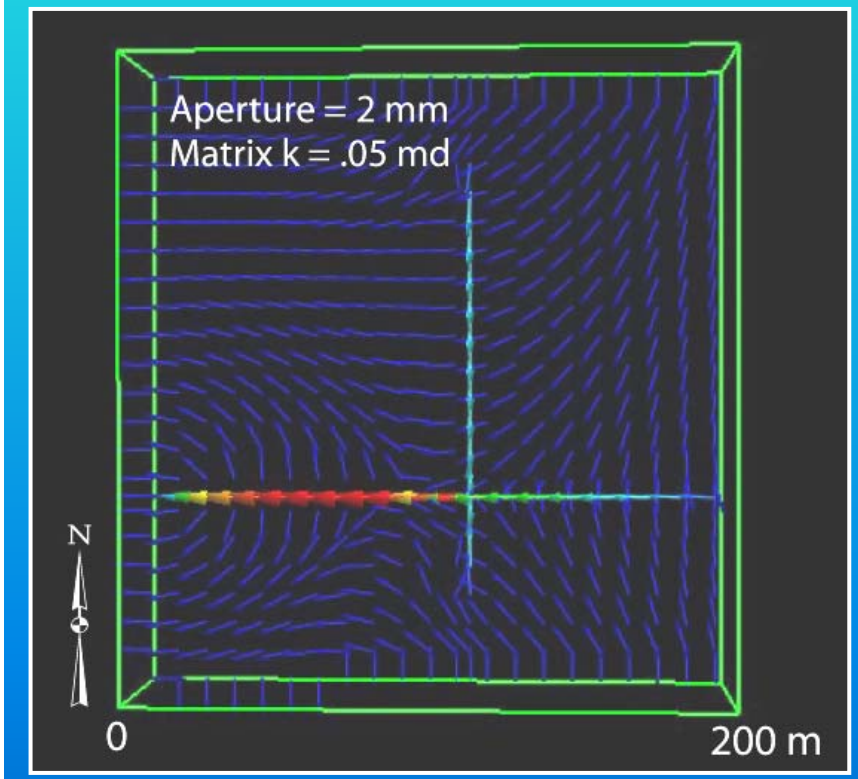
Koenig, 1989

COMPARTMENT MODEL

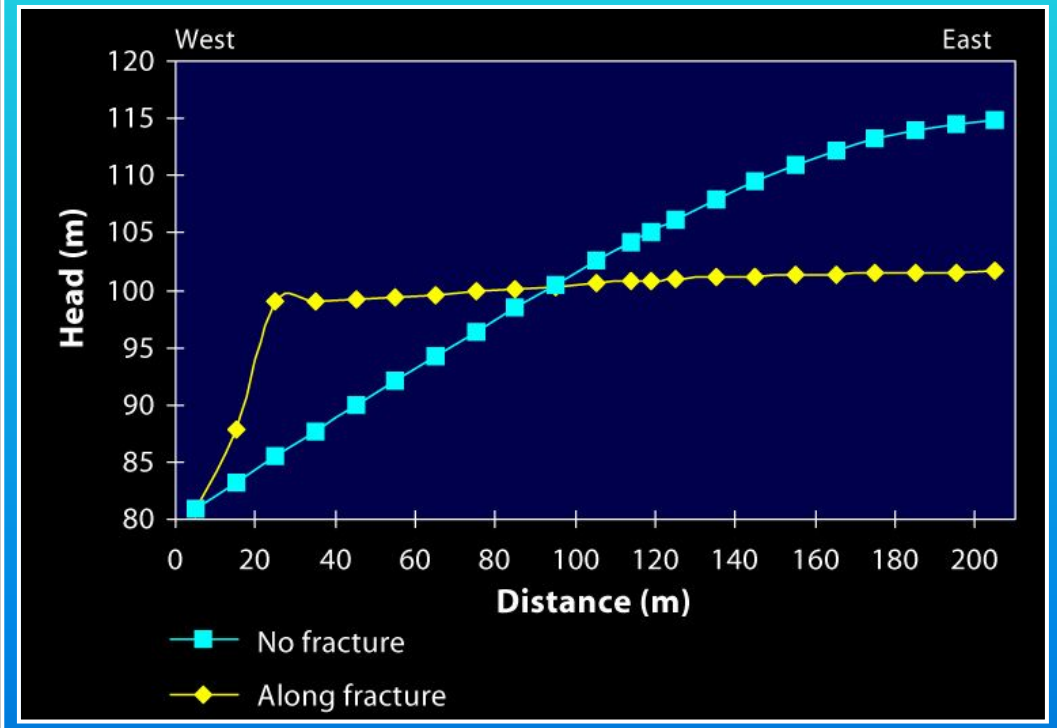


PRELIMINARY TOUGH2 MODELS

A. Flow model



B. Head profiles



WRAP-UP

Pottsville fracture systems follow statistical scaling rules that facilitate DFN modeling.

DFNModeler software shows promise as a risk assessment tool for carbon sequestration.

Two years remaining in study - visualization and analysis capabilities being enhanced, modeling to focus on SECARB Black Warrior coal site.